Unveiling Deep-Sea Coral Ecosystems

Beneath the ocean surface, America's marine waters hold rich treasures of ecosystems full of life supported by the complex structures of deep-sea corals. Sustainable management of these resources requires knowledge of their extent and condition. NOAA's Deep Sea Coral Research and Technology Program provides this knowledge.

In FY 2010 and 2011, NOAA received $2.5 million each year to implement the program. Through the research studies summarized in Appendix I, the program expanded our nation's collective knowledge of deep-sea coral distribution and biology, as well as our understanding of the marine life that uses the corals as shelter, feeding platforms, and breeding grounds. A focus during this reporting period was the southeastern United States, where significant discoveries of deep-sea coral communities occurred.

Studying the Deep Reefs of the Southeast

In waters off the southeastern United States, NOAA concluded a three-year field study of deep-sea coral ecosystems from North Carolina to Florida, with the final research cruise returning to shore in fall 2011. Over the last three years, NOAA and partners used a wide range of high-tech tools on seven research cruises to find and study deep-sea coral reefs. Five cruises used a sonar technology called multibeam to discover areas where the seafloor has the particular size, shape, and texture that indicate probable locations of deep-sea corals. This resulted in 1,480 square miles of high-resolution seafloor maps. On five expeditions, scientists sent a submersible or an unmanned research vehicle—known as a remotely operated vehicle, or ROV—to the bottom of the ocean to visually survey the deep-sea coral communities. Fifty-eight ROV and submersible dives brought back biological specimens, hundreds of hours of video, and thousands of photos, documenting the myriad species—corals, fishes, crabs, and more—at sites more than 2,000 feet deep (Figure 1).

The videos, photos, and over 1,000 biological samples collected over these three years are undergoing analysis. Scientists are reviewing them to quantify the abundance of fishes and invertebrates living in deep-sea coral communities, identify the species encountered, estimate the corals' ages and growth rates, and understand their population structure by examining their DNA. These results are puzzle pieces that, when fit together, will tell us more about what functions deep-sea corals serve for the ocean ecosystem, how vulnerable or resilient deep-sea corals are to disturbance, what environmental conditions are most suitable for deep-sea corals to thrive and, based on that, where additional deep-sea corals might be found.